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From Herschel's Treatise on Astronomy.

NATURE AND NUMBER OF COMETS.

The extraordinary aspect of comets, their rapid and seemingly irregular motions, the unexpected manner in which they often burst upon us, and the imposing magnitudes which they occasionally assume, have in all ages rendered them objects of astonishment, not unmixed with superstitious dread to the uninstructed, and an enigma to those most conversant with the wonders of creation and the operations of natural causes. Even now, that we have ceased to regard their movements as irregular, or as governed by other laws than those which retain the planets in their orbits, their intimate nature, and the offices they perform in the economy of our system, are as much unknown as ever. No rational or even plausible account has yet been rendered of those immensely voluminous appendages which they bear about with them, and which are known by the name of their tails, (though improperly, since they often precede them in their motions,) any more than of several other singularities which they present.

The number of comets which have been astronomically observed, or of which notices have been recorded in history, is very great, amounting to several hundreds; and when we consider that in the earlier ages of astronomy, and indeed in more recent times, before the invention of the telescope, only large and conspicuous ones were noticed; and that, since due attention has been paid to the subject, scarcely a year has passed without the observation of one or two of these bodies, and that sometimes two and even three have appeared at once; it will be easily supposed that their actual number must be at least many thousands. Multitudes, indeed, must escape all observation, by reason of their paths traversing only that part of the heavens which is above the horizon in the daytime. Comets so circumstanced can only become visible by the rare coincidence of a total eclipse of the sun,—a coincidence which happened, as related by Seneca, 60 years before Christ, when a large comet was actually observed very near the sun. Several, however, stand on record as having been bright enough to be seen in the daytime, even at noon and in bright sunshine. Such were the comets of 1402 and 1532, and that which appeared a little before the assassination of Cæsar, and was (*afterwards*) supposed to have predicted his death.

That feelings of awe and astonishment should be excited by the sudden and unexpected appearance of a great comet, is no way surprising; being, in fact, according to the accounts we have of such events, one of the most brilliant and imposing of all natural phenomena. Comets consist for the most part of a large and splendid but ill defined nebulous mass of light, called the head, which is usually much brighter towards the centre, and offers the appearanee of a vivid *nucleus*, like a star or planet. From the head, and in a direction *opposite to that in which the sun is situated* from the comet, appear to diverge two streams of light, which grow broader and more diffused at a distance from the head, and which sometimes close in and unite at a little distance behind it, sometimes continue distinct for a great part of their course; producing an effect like that of the trains left by some bright meteors, or like the diverging fire of a sky rocket, (only without sparks or perceptible motion.) This is the tail. This magnificent appendage attains occasionally an immense apparent length. Aristotle relates of the tail of the comet of 371 A. C., that it occupied a third of the hemisphere, or 60°; that of A. D. 1618 is stated to have been attended by a train no less than 104° in length. The comet of 1680, the most celebrated of modern times, and on many accounts the most remarkable of all, with a head not exceeding in brightness a star of the second magnitude, covered with its tail an extent of more than 70° of the heavens, or, as some accounts state, 90°.

The tail is, however, by no means an invariable appendage of comets. Many of the brightest have been observed to have short and feeble tails, and not a few have been entirely without them. Those of 1585 and 1763 offered no vestige of a tail; and Cassini describes the comet of 1682 as being as round and as bright as Jupiter. On the other hand, instances are not wanting of comets furnished with many tails or streams of diverging light. That of 1744 had no less than six, spread out like an immense fan, extending to a distance of nearly 30° in length. The tails of comets, too, are often curved, bending, in general, towards the region which the comet has left, as if moving somewhat more slowly, or as if resisted in their course.

The smaller comets, such as are visible only in telescopes, or with difficulty by the naked eye, and which are by far the most numerous, offer very frequently no appearance of a tail, and appear only as round or somewhat oval vaporous masses, more dense toward the centre, where, however, they appear to have no distinct nucleus, or any thing which seems entitled to be considered as a solid body. Stars of the smallest magnitude remain distinctly visible, though covered by what appears to be the densest portion of their substance; although the same stars would be completely obliterated by a moderate fog, extending only a few yards from the surface of the earth. And since it is an observed fact, that even those larger comets which have presented the appearance of a nucleus have yet exhibited *no phases*, though we cannot doubt that they shine by the reflected solar light, it follows that even these can only be regarded as great masses of thin vapor, susceptible of being penetrated through their whole substance by the sunbeams, and reflecting them alike from their interior parts and from their surfaces. Nor will any one regard this explanation as forced, or feel disposed to resort to a phosphorescent quality in the comet itself, to account for the phenomena in question, when we consider (what will be hereafter shown) the enormous magnitude of the space thus illuminated, and the extremely small *mass* which there is ground to attribute to these bodies. It will then be evident that the most unsubstantial clouds which float in the highest regions of our atmosphere, and seem at sunset to be drenched in light, and to glow throughout their whole depth as if in actual ignition, without any shadow or dark side, must be looked upon as dense and massive bodies compared with the filmy and all but spiritual texture of a comet. Accordingly, whenever powerful telescopes have been turned on these bodies, they have not failed to dispel the illusion which attributes solidity to that more condensed part of the head, which appears to the naked eye as a nucleus; though it is true that in some, a very minute stellar point *has* been seen, indicating the existence of a solid body.

It is in all probability to the feeble coercion of the elastic power of their gaseous parts, by the gravitation of so small a central mass, that we must attribute this extraordinary development of the atmospheres of comets. If the earth, retaining its present size, were reduced by any internal change (as by hollowing out its central parts) to one thousandth part of its

actual mass, its coercive power over the atmosphere would be diminished in the same proportion, and in consequence the latter would expand to a thousand times its actual bulk; and indeed much more, owing to the still farther diminution of gravity, by the recess of the upper parts from the centre.

That the luminous part of a comet is something in the nature of a smoke, fog, or cloud, suspended in a transparent atmosphere, is evident from a fact which has been often noticed, viz: that the portion of the tail where it comes up to, and surrounds the head, is yet separated from it by an interval less luminous, as if sustained and kept off from contact by a transparent stratum, as we often see one layer of clouds laid over another with a considerable clear space between. These, and most of the other facts observed in the history of comets, appear to indicate that the structure of a comet, as seen in section in the direction of its length, must be that of a hollow envelope, of a parabolic form, enclosing near its vertex the nucleus and head. This would account for the apparent division of the tail into two principal lateral branches, the envelope being oblique to the line of sight at its borders, and therefore a greater depth of illuminated matter being there exposed to the eye. In all probability, however, they admit great varieties of structure, and among them may very possibly be bodies of widely different physical constitution.

We come now to speak of the motions of comets. These are apparently most irregular and capricious. Sometimes they remain in sight for only a few days, at others for many months —some move with extreme slowness, others with extraordinary velocity; while not unfrequently, the two extremes of apparent speed are exhibited by the same comet in different parts of its course. The comet of 1472 described an arc of the heavens of 120° in extent in a single day. Some pursue a direct, some a retrograde, and others a tortuous and very irregular course; nor do they confine themselves, like the planets, within any certain region of the heavens, but traverse indifferently every part. Their variations in apparent size, during the time they continue visible, are no less remarkable than those of their velocity; sometimes they make their first appearance as faint and slow moving objects, with little or no tail; but by degrees accelerate, enlarge and throw out from them this appendage, which increases in length and brightness till (as always happens in such cases) they approach the sun, and are lost in his beams. After a time they again emerge, on the other side, receding from the sun with a velocity at first rapid, but gradually decaying. It is after thus passing the sun, and not till then, that they shine forth in all their splendor, and that their tails acquire their greatest length and development; thus indicating plainly the action of the sun's rays as the exciting cause of that extraordinary emanation. As they continue to recede from the sun, their motion diminishes and the tail dies away, or is absorbed into the head, which itself grows continually feebler, and is at length altogether lost sight of, in by far the greater number of cases never to be seen more.

Without the clue furnished by the theory of gravitation, the enigma of these seemingly irregular and capricious movements might have remained for ever unresolved. But Newton having demonstrated the possibility of any conic section whatever being described about the sun, by a body revolving under the dominion of that law, immediately perceived the applicability of the general proposition to the case of cometary orbits, and the great comet of 1680, one of the most remarkable on record, both for the immense length of its tail and for the excessive closeness of its approach to the sun (within one sixth of the diameter of that luminary,) afforded him an excellent opportunity for the trial of his theory. The success of the attempt was complete. He ascertained that this comet described about the sun as its focus an elliptic orbit of so great an eccentricity as to be undistinguishable from a parabola, (which is the extreme or limiting form of the ellipse when the axis becomes infinite,) and that in this orbit the areas described about the sun were, as in the planetary ellipses, proportional to the times. The representation of the apparent motions of this comet by such an orbit, throughout its whole observed course, was found to be as complete as those of the motions of the planets in their nearly circular paths. From that time it became a received truth, that the motions of comets are regulated by the same general laws as those of the planets—the difference in the cases consisting only in the extravagant elongation of their ellipses, and in the absence of any limit to the inclinations of their planes to that of the ecliptic—or any general coincidence in the direction of the motions from west to east, rather than from east to west, like what is observed among the planets.

It is a problem of pure geometry, from the general laws of elliptic or parabolic motion, to find the situation and dimensions of the ellipse or parabola which shall represent the motion of any given comet. In general, three complete observations of its right ascension and declination, with the times at which they were made, suffice for the solution of this problem, (which is, however, a very difficult one,) and for the determination of the elements of the orbit. These consist, *mutatis mutandis*, of the same data as are required for the computation of the motion of a planet: and, once determined, it becomes very easy to compare them with the whole observed course of the comet, and to put to the severest trial the truth of those general laws on which all such calculations are founded.

For the Advocate of Science.

SCIENTIFIC DIALOGUES. No. 6.

Ellen.—One of my principal objections against making the study of nature a leading pursuit, is that you cannot enjoy it in winter; while on the other hand, the dreariness of this season only enhances the value of a novel or a tale.

John.—You are hard pushed for arguments, cousin, to make such an objection as that.

Ellen.—You cannot deny it. What flowers do you find now in your muddy rambles? and what animals have you to look at except cockroaches and mice, and such like bugs and beasts?

John.—If you had been with us in our walk the last frosty morning, I think you would change your notes. We stopt to examine the bank where they dig sand for building, and found it quite a geological map. It was a leaf in the book of nature on which was written the history of past ages of the world. We saw at a glance which of the strata were diluvial and which alluvial.

Ellen.—Poh, cousin, do talk English; this way of giving Latin names to every thing, I cannot abide. I suppose, however, you learn it from the books you read, and I am certain that scientific books would be more read if the writers would express themselves in plain English, and not try to appear learned by using hard words.

John.—If you were my sister Ellen, or some one I did not care for offending with advice, I would advise you never to utter such a speech again; it only displays your ignorance.

Louis.—Come John! I will defend Ellen in that opinion. I have experienced the same difficulty. After our excursion the other day I was so much interested in the geology of the sand-pit, that I took up the "Advocate of Science" and determined to read some of the essays on geology in it. But before I had got through half a dozen lines, I came across several jawbreakers which were sheer nonsense to me; and so I gave it up for a bad job.

John.—That was your fault. I have not met with a single hard word in those essays that was not fully explained when first introduced. Had you begun where you ought, at the beginning of the series of essays, that difficulty would not have occurred.

Louis.—But why not give the words in English throughout, instead of smothering them in Latin and Greek?

John.—There are no English words, synonymous with them, I suppose.

Ellen.—You *suppose!* I always supposed that our tongue is as full as any other, and supplies as great a variety of words.

John.—A lady can out-talk me at any time. I must apply to father for assistance.

Father.—John is right in the main, but he is not quite correct in presuming that the hard words, as you call them, are Latin and not English words. Most of them are in reality English words, and will be found in any modern dictionary of our language.

Louis.—Then why have I never met with them in my reading.

John.—I can answer that question. Because they dont appertain to castles and towers, and knights and fairy lands, and true love and murder.

Father.—You are rather severe, John; one may read many useful and instructive books without meeting with those words which belong strictly to geology, or any other particular science. There are many words or terms in each science, which are employed in a technical sense, and constitute a vocabulary or language peculiar to that science. Many of these terms are, it is true, merely Latin or Greek words, adopted into our tongue, with very little alteration from the original; but this cannot be objected to, because it is even more easy to recollect a Latin or Greek name than a new English one made especially for the purpose.

John.—I think I have got a parallel case. Ellen has been racking her brains for a month to invent a new name for that pretty little dog which somebody gave her lately. Now, suppose she adopts a Latin name, such as *Byronia*, or *Bulweriana*; would it not be quite as easily remembered as an English name, such for instance as *crookedlegs*, or *goodfornought*? I am sure it would suit her taste better.

Father.—Your arguments, John, are calculated to provoke, rather than to convince. Not only every science, but also every trade and occupation has its peculiar names and phrases. A lawyer talks of his *briefs* and *subpœnas*; a surgeon of his *scalpel* and *tourniquet*; a watchmaker of his *escapements* and *balance wheel*; a ploughman of his *swingle-tree* and *coulter*. Ellen herself, I dare say, uses many terms in relation to domestic affairs, quite unintelligible to scientific men.

Louis.—Now that I am reminded of it, I well recollect listening to a discussion between cousin Ellen and her seamstress, which puzzled me quite as much as the hard words in the Advocate of Science. There were *gussets* and *gores*, *hems* and *fells*, *backstitches*, and *catstitches*, and a parcel of similar Hebrew names.

Father.—Such terms are adopted to obviate the necessity of using a phrase descriptive of each object and process. Ellen, let me ask you what you mean by a *gusset*.

Ellen.—A gusset is a three cornered piece of stuff, sowed in certain situations to prevent the garment containing it from being ripped. But I could make one, more easily than describe it so that you could comprehend me.

Father.—Well, this is an instance in point, illustrating the necessity of technical terms. Suppose you were giving directions about a dress, and were to avoid the use of all such expressions, describing what a gusset is instead of naming it, and doing the same of gores, and all other such things. Would you not be likely to make a long and awkward speech?

Ellen.—I confess there may be a necessity for the introduction of hard words into science, but it is very unfortunate; for I shall never be able to get over them.

Father.—Guard yourself against that mischievous notion, Ellen. The difficulty you complain of is very easily remedied. It only requires a little patience and a little reflection. You are so much accustomed to light reading, which requires and admits no thought, that I fear you have acquired a habit of negligence and thoughtlessness in this respect. If you began at the beginning of any elementary treatise on science, and attend to the explanations of the terms as they are introduced, and examine the dictionary when you met with a strange word which is not explained in the book, you will be able to read understandingly, and to profit by it. You ought always to bear in mind, that to read without thinking, is worse than useless. You ought constantly to remember that a *principal source of enjoyment in reading consists in reflecting on what you read.* The present age is sometimes called a *reading age.* But it is to be feared that the more reading, the less thinking is there. Reading is principally valuable as it furnishes food for thought; and unless the mind apprehends this food and digests it, its faculties become materially impaired. I have known several great readers who did not take sufficient pains to reflect on what they read, and whose mental powers have in consequence suffered a very considerable degree of injury; one in particular whose memory has almost been ruined by this practice.

John.—I sûppose that kind of reading is to the mind, what *bolting*, as gourmands technically call the cramming of the stomach with unchewed food, is to the stomach. The "Journal of Health" says this practice enervates and destroys the powers of the stomach, and so I reckon that bolting books has the same effect on the understanding.

Father.—A homely comparison, but a correct one. We have however, nearly lost sight of the original subject. You are probably all convinced by this time of the propriety of designating objects by words, instead of phrases; that is, using technical terms.

Louis.—I am quite reconciled and even pleased with them now. I had no idea of the design, and correct application of scientific terms. It seems to me that we might with as much reason attempt to do away the use of the most common names in our language, as to dispense with those *hard words* such as we have been speaking of. For instance, instead of saying Sun and Moon, we might say, *the luminary that shines in the heavens by day*, and *the principal of those which shine by night.* What a vast deal of talking we should have to do, to say a little.

Ellen.—I am also very well satisfied on that point. But I have another objection to make against scientific works; and that is that the names of all the plants and animals and so forth are given in Latin, and the common names not mentioned. Now this appears to me to confine this kind of reading, to the initiated and to tend to deter others from undertaking it. I am satisfied that I should have studied botany had it not been for the host of hard Latin names that I saw before me.

Father. The objection you make to the study of science is a very common one; but it is capable of refutation without much labor. Scientific men in all parts of the world have agreed to adopt the Latin, as a kind of universal language. The hard names that you complain of are mostly Latin names, and possess this advantage over common names, that they are intelligible to men of science in every nation; while common names are local, and are mostly unintelligible to those who live beyond a small district of country.

Ellen. I can see no necessity, even admitting the propriety of giving Latin and Greek names to animals and plants, for making them so long. Some of them, instead of furnishing a word to be substituted for a phrase, give us a complete phrase, or something worse, instead of a simple name or word. Thus, for instance, I find in this "Flora Philadelphica" the name of *Chrysosplenium oppositifolium*, applied to an insignificant looking plant.

Father. If you were capable of analizing those words, you

would find more meaning in them than you suppose, although, being unusually long, they do not present a fair specimen of botanical nomenclature. The former name is composed of two Greek words, signifying *gold* and *leaf*, because of some peculiar appearance of the plant; and the other name, *oppositifolium*, implies, as any body might observe, opposite leaves, because the leaves of the plant are opposite to each other. But we must converse on this subject more fully at another time.

Q.

THE ADVOCATE OF SCIENCE.

First Month 23, 1834.

TO OUR READERS AND CORRESPONDENTS.

We continue the chapter from Herschell's Astronomy, on comets, in the present paper. It is long, but our readers will find it worthy attentive perusal.

Our readers are referred to the meteorological summary, for 1833, which they will find on another page. Its details are very interesting and valuable. Accident,—for such things will occur,—placed in our possession a table of the quantity of rain which has fallen each year from 1810 to the present time; we will present this in our next number.

We hope "Q." will not be so sparing of his dialogues in future. His plan of writing is an excellent one, and calculated to interest both the learner and the learned.

The questions of our correspondent S. L. M. inserted in this number of the Advocate, are interesting, and admit, especially the first one, of very perspicuous and philosophical solutions. May we depend on "Boreas" to explain them?

INFLUENCE OF THE MOON ON THE WEATHER.

A large proportion of the common people and many others, believe that the moon exercises much influence upon the atmospheric changes on the earth. For the purpose of ascertaining the truth or error of this opinion, an eminent French philosopher, M. Arrago, recently investigated certain meteorological tables, kept in France during a period of many years. The result of his inquiry was, that more rainy days occur, and more rain falls, during the *increase* than during the *decrease* of the moon.

We have in our possession a register of the weather, kept at Wilmington, Del., for a number of years, from which we have made out some tables on a similar plan. The result, however, of our investigation does not coincide with that just stated. In some years a remarkable difference is observed in the quantity of rainy weather between the different phases; but in other years nothing of the kind is perceptible. Our tables, however, have not yet been completed, so as to enable us to give any definite results. This we shall accomplish shortly.

The following anecdote,—which every body will say is pretty good,—we extract from a literary periodical, "The Western Olive Branch," published in St. Clairsville, Ohio.

"Chrysippus, an ancient Greek philosopher, was remarkable for extreme poverty. Some of his orations and writings came to the ear of Polycrates, King of Samos; he was so well pleased with them, that he sent him a present in money, to the value of about $5000. A short time after the philosopher presented himself before the king, and delivered the exact sum he had received. Why, man, said Polycrates, what do you mean? Do you, that are so needy that your necessities are proverbial, reject such a present, and that from the hands of a king? Please your majesty, said the philosopher, three days and nights have passed since I received your money—during that time I have not enjoyed a moment of sleep for fear of being robbed. Be so gracious, therefore, as to receive back your money, as I prefer the hunger and misery of poverty, to the disquiets and discontents that attend riches."

When we first read this, it sounded like an out of the way concern, and we were induced to examine authorities, from which it appears this said Chrysippus finished his career 207 years B. C. in the 83d year of his age; and he was more distinguished for his natural abilities and industry, than for poverty. He died,—as many do in the present day,—through excess of wine. But some pretend to say that his death was occasioned by laughter on seeing an ass eating figs from a silver plate.

Polycrates, a tyrant of Samos, was put to death 522 years B. C. So that one of these men was born 232 years after the other was put to death. Thus the foregoing anecdote presents an inconsistency which will require the inventive genius of its author to reconcile with historical dates.

We object to the publication of such things, because they are calculated to disseminate error. Whoever wrote the one above,—for we will not charge it to the editor of the paper, though he gives neither quotations nor credit,—might have found many well authenticated facts to convey the very the same moral, which is quite a valid one.

It is to be hoped our brother will not withhold from us the spirit of the "*Olive Branch*," if we recommend him, as a future guide, to place all such articles under the head of "Original Tales."

The difficulties which originate in gross superstition, and which are encountered by enterprising travellers, in exploring a savage country, are forcibly illustrated by the following extract from Denham and Clapperton's Journal, while in Africa. They had arrived at Mora, the capital of Mandara, where they were received with as great marks of favor as could be expected.—The party were escorted to the capital amid music, with long pipes like clarionets, and of two immense trumpets. On arriving at the royal tent—a dark blue canopy,—the sultan was found sitting on a mud bench, surrounded by about 200 attendants, handsomely arrayed in cotton and silk robes. He was an intelligent little man about fifty years old, with his beard dyed of a dark blue colour.

Courteous salutations were exchanged, during which time the sultan steadily eyed Denham, of whom he at last inquired; and the traveller was advantageously introduced as belonging to a distant and powerful nation, allies of the Bashaw of Tripoli. The fatal question was asked—"Is he Moslem?" "La! La!—no, no!" "What! has the great bashaw Caffre friends?"—Every eye was instantly averted, the sun of Major Denham's favor was set, and he was never more permitted to enter the palace.

"The bigotry of this court seems to have surpassed even the usual bitterness of the African tribes, and our traveller had to undergo a regular persecution, carried on especially by Malem Chadily, the leading fighi or doctor of the court. As Major Denham was showing to the admiring chiefs the mode of writing with a pencil, and effacing it with Indian rubber, Malem wrote some words of the Koran with such force that the rubber could not wholly remove the traces of them. He then exclaimed with triumph, "They are the words of God, delivered to his prophet; I defy you to erase them." The Major was then called upon to acknowledge this great miracle; and, as his countenance still expressed incredulity, he was viewed with looks of such mingled contempt and indignation as induced him to retire. Malem, however, again assailed him with the assurance that this was only one of the many miracles which he could show as wrought by the Koran; imploring him to turn, and paradise would be his, otherwise nothing could save him ftom eternal fire. "Oh!" said he, "while sitting in the third heaven I shall see you in the midst of the flames, crying out to your friend Barca Gana and myself for a drop of water; but the gulf will be between us:" his tears then flowed profusely. The Major taking the general aside, entreated to be relieved from this incessant persecution; but Gana assured him that the fighi was a great and holy man, to whom he ought to listen.—He then held out not only paradise, but honors, slaves, and wives of the first families, as gifts to be lavished on him by the sheik if he would renounce his unbelief. Major Denham asked the commander, what would be thought of himself if he should go to England and turn Christian? "God forbid!" exclaimed he; "but how can you compare our faiths; mine would lead

you to paradise, while yours would bring me to hell. Not a word more."—Nothing appears to have annoyed the stranger more than to be told that he was of the same faith with the kerdies or savages; little distinction being made between any who denied the Koran. After a long discussion of this question, he thought the validity of his reasoning would be admitted, when he could point to a party of those wretches devouring a dead horse, and appealed to Boo Khalloom if he had ever seen the English do the same; but to this, which was not after all a very deep theological argument, the Arab replied,—"I know they eat the flesh of swine, and, God knows, that is worse."—"Grant me patience," exclaimed I to myself,—"this is almost too much to bear and to remain silent."

For the Advocate of Science.

Mr. Advocate,—In the performance of my domestic duties I have frequently been perplexed to account for some small occurrences, or *phenomena*, as you would probably call them, which it would give me pleasure to see explained in your paper.

1. Why does the sun extinguish the fire?
2. Why does a damp day make the chimney smoke?
3. Why does the wick of the candle or lamp become more encrusted at one time than another.

S. L. M.

For the Advocate of Science.

The hint given in a late number, relative to the use of chlorine to deprive furs of their offensive odor, deserves attention. Your correspondent, however, does not specify the mode in which the gas is to be applied. The most common and easy method of fumigating with chlorine, is by means of the chloride of soda, or of lime, just in the same manner as these compounds were used during the prevalence of the malignant cholera, to neutralize the supposed poisonous effluvia in the atmosphere. I am inclined to believe that this method would not materially affect the color, as mentioned by your correspondent. The pyroligneous acid is another preparation capable of depriving many substances of their odor. It might be sprinkled over the fur, which ought afterwards to be well aired. This application would require to be repeated several times.

Furs that are in constant use for some time gradually part with their odor by exposure to the atmosphere. We presume that any article of the kind would lose all its offensive perfume by being hung up in a well ventilated place, and exposed to the wind and to the sun. This process, however, would require time.

DAVY.

DR. GODMAN'S RAMBLES OF A NATURALIST.

Continued from page 166.

It rarely happens that any of the works of nature are wholly productive of evil, and even the crows, troublesome as they are, contribute in a small degree to the good of the district they frequent. Thus, though they destroy eggs and young poultry, plunder the cornfields, and carry off whatever may serve for food, they also rid the surface of the earth of a considerable quantity of carrion, and a vast multitude of insects and their destructive larvæ.

The crows are very usefully employed when they alight upon newly ploughed fields, and pick up great numbers of those large and long-lived worms, which are so destructive to the roots of all growing vegetables; and they are scarcely less so, when they follow the seine haulers along the shores, and pick up the small fishes, which would otherwise be left to putrify and load the air with unpleasant vapors. Nevertheless, they become far more numerous in some parts of the country than is at all necessary to the good of the inhabitants, and whoever would devise a method of lessening their numbers suddenly, would certainly be doing a service to the community.

About a quarter of a mile above the house I lived in, on Curtis' creek, the shore was a sand bank or bluff, twenty or thirty feet high, crowned with a dense young pine forest to its very edge. Almost directly opposite, the shore was flat, and formed a point extending in the form of a broad sand bar, for a considerable distance into the water, and when the tide was low, this flat afforded a fine level space, to which nothing could approach in either direction without being easily seen. At a short distance from the water, a young swamp wood of maple, gum, oaks, &c. extended back, towards some higher ground. As the sun descended, and threw his last rays in one broad sheet of golden effulgence over the crystal mirror of the waters, innumerable companies of crows arrived daily, and settled on this point, for the purpose of drinking, picking up gravel, and uniting in one body prior to retiring for the night to their accustomed dormitory. The trees adjacent and all the shore would be literally blackened by those plumed marauders, while their increasing outcries, chattering and screams, were almost deafening. It certainly seems that they derive great pleasure from their social habits; and I often amused myself by thinking the uninterrupted clatter which was kept up, as the different gangs united with the main body, was produced by the recital of the adventures they had encountered during their last marauding excursions. As the sun became entirely sunk below the horizon, the grand flock crossed to the sand bluff on the opposite side, where they generally spent a few moments, in picking up a further supply of gravel, and then rising in dense and ample column, they sought their habitual roost in the deep entanglements of the distant pines. This daily visit to the point, so near to my dwelling, and so accessible by means of the skiff, led me to hope that I should have considerable success in destroying them. Full of such anticipations, I loaded two guns, and proceeded in my boat to the expected place of action, previous to the arrival of the crows. My view was to have my boat somewhere about half way between the two shores, and as they never manifested much fear of boats, to take my chance of firing upon the main body as they were flying over my head to the opposite side of the river. Shortly after I had gained my station, the companies began to arrive, and every thing went on as usual.

But whether they suspected some mischief from seeing a boat so long stationary in their vicinity, or could see and distinguish the guns in the boat, I am unable to say: the fact was, however, that when they set out to fly over, they passed at an elevation which secured them from my artillery effectually, although, on ordinary occasions, they were in the habit of flying over me at a height of not more than twenty or thirty feet. I returned home without having had a shot, but resolved to try if I could not succeed better the next day. The same result followed the experiment, and when I fired at one gang, which it appeared possible to attain, the instant the gun was discharged, the crows made a sort of halt, descended considerably, flying in circles, and screaming most vociferously, as if in contempt or derision. Had I been prepared for this, a few of them might have suffered for their bravado. But my second gun was in the bow of the boat, and before I could get it, the black gentry had risen to their former security.

While we were sitting at tea that evening, a black came to inform me that a considerable flock of crows, which had arrived too late to join the great flock, had pitched in the young pines not a great way from the house, and at a short distance from the road side. We quickly had the guns in readiness, and I scarcely could restrain my impatience until it should be late enough and dark enough to give us a chance of success. Without thinking of any thing but the great number of crows, and their inability to fly to advantage in the night, my notions of the numbers we should bring home were extravagant enough, and I only regretted that we might be obliged to leave some behind. At length, led by the black boy, we sallied forth, and soon arrived in the vicinity of this temporary and unusual roost; and now the true character of the enterprise began to appear. We were to leave the road, and penetrate several hundred yards among the pines, whose proximity to each other, and the difficulty of moving between which, on account of the dead branches, has been heretofore stated. Next, we had to be careful not to alarm the crows before we were ready to act, and at the same time were to advance with cocked guns in our hands. The only way of moving forwards at all, I found to be that of turning my shoulders as much as possible to the dead branches, and breaking my way as gently as I could. At last we reached the trees upon which the crows were roosting; but as the foliage of the young pines was extremely dense, and the birds were full forty feet above the ground, it was out of the question to distinguish where the greatest number were situated. Selecting the trees which appeared by the greater darkness of their summits to be most heavily laden with our game, my companion and I pulled our triggers at the same moment. The report was followed by considerable outcries from the crows, by a heavy shower of pine twigs and leaves upon which the shot had taken effect, and a deafening roar caused by the sudden rising on the wing of the alarmed sleepers. *One* crow at length fell near me, which was wounded too badly to fly or retain his perch, and as the flock had gone entirely off, with this one crow did I return rather crestfallen from my grand nocturnal expedition. This crow, however, afforded me instructive employment and amusement during the next day, in the dissection of its nerves and organs of sense, and I know not that I ever derived more pleasure from any anatomical examination, than I did from the dissection of its internal ear. The extent and convolutions of its semicircular canals, show how highly the sense of hearing is perfected in these creatures, and those who wish to be convinced of the truth of what we have stated in relation to them, may still see this identical crow skull, in the Baltimore Museum, to which I presented it after finishing the dissection. At least, I saw it there a year or two since, though I little thought, when employed in examining, or even when I last saw it, that it would ever be the subject of such a reference "in a printed book."

Not easily disheartened by preceding failures, I next resolved to try to outwit the crows, and for this purpose prepared a long line, to which a very considerable number of lateral lines were tied, having each a very small fishing hook at the end. Each of these hooks were baited with a single grain of corn, so cunningly put on, that it seemed impossible that the grain could be taken up whithout the hook being swallowed with it.

About four o'clock, in order to be in full time, I rowed up to the sandy point, made fast my main line to a bush, and extending it toward the water, pegged it down at the other end securely in the sand. I next arranged all

my baited lines, and then covering them all nicely with sand, left nothing exposed but the bait. This done, I scattered a quantity of corn all around, to render the baits as little liable to suspicion as possible. After taking a final view of the arrangement, which seemed a very hopeful one, I pulled my boat gently homeward, to wait the event of my solicitude for the capture of the crows. As usual, they arrived in thousands, blackened the sand beach, chattered, screamed, and fluttered about in great glee, and finally sailed over the creek and away to their roost, without having left a solitary unfortunate to pay for having meddled with my baited hooks. I jumped into the skiff, and soon paid a visit to my unsuccessful snare. The corn was all gone; the very hooks were all bare, and it was evident that some other expedient must be adopted before I could hope to succeed. Had I caught but one or two *alive*, it was my intention to have employed them to procure the destruction of others, in a manner I shall hereafter describe.

For the Advocate of Science.

Meteorological Summary,

FOR EACH MONTH OF THE YEAR 1833, WITH A SUMMARY FOR THE WHOLE YEAR, AND ALSO FOR THE YEAR 1832.

	THERMOMETER. (Deg.)							BAROMETER. (Inches.)							DAYS.				INCHES.			DAYS.								
	Mean at sunrise.	Mean at mid-day.	Monthly mean.	Maximum.	Minimum.	Range.	Warmest day.	Coldest day.	Mean at sunrise.	Mean at mid-day.	Monthly mean.	Maximum.	Minimum.	Range.	Propor'n clr. weather.	Proportion cloudy do.	Whole days clear.	No. of days rain.	No. of days snow.	Quantity of rain.	Quantity of snow.	Quantity of water.	Northerly winds.	Easterly winds.	Southerly winds.	Mean force A. M.	Mean force noon.	Mean force evening.	Monthly mean force.	Easterly storms.	No. of high winds.	No. electrified clouds.	No. of auroras.
Jan.	30.45	38.71	34.58	62	12	50	55	15	29.76	29.73	29.745	30.21	29.09	1.12	13	18	8	7	3	4.60	¼	4.70	8	12	11	1.80	1.84	1.52	1.72	6	4	0	1
Feb.	28.18	40.61	34.39	56	16	40	46.5	22.5	29.79	29.75	29.77	30.05	29.35	.70	16	12	10	5	3	1.10	10¼	2.33	12	6	10	1.86	2.11	1.50	1.82	6	4	0	0
March	31.06	45.19	38.13	65	4	61	59	14.5	29.84	29.82	29.83	30.35	29.40	.95	16	15	12	4	3	.82	8	1.83	12	7	12	1.68	2.07	1.26	1.67	3	2	1	1
April	45.37	63.03	54.20	84	34	50	69	43.5	29.86	29.83	29.845	30.15	29.23	.92	22	8	14	6	0	1.66	0	1.66	5	9	16	1.80	1.85	1.30	1.65	3	2	2	0
May	58.58	67.81	63.19	81	44	37	75	49	29.88	29.87	29.875	30.10	29.56	.54	14	17	7	16	0	7.80	0	7.80	5	13	13	1.90	2.10	1.48	1.83	5	0	11	1
June	60.10	74.50	67.30	84	51	33	79.5	59.5	29.79	29.78	29.785	30.04	29.49	.55	19	11	13	10	0	5.15	0	5.15	10	8	12	1.70	1.50	0.70	1.30	4	1	3	1
July	65.58	81.48	73.53	90	57	33	82.5	66.5	29.87	29.86	29.865	30.10	29.62	.87	22	9	18	11	0	6.10	0	6.10	12	7	12	1.58	1.55	1.10	1.41	1	5	15	1
Aug.	63.03	78.23	70.63	86	50	36	78.5	59.5	29.85	29.81	29.83	30.04	29.59	.45	22	9	17	5	0	2.60	0	2.60	9	13	9	1.52	1.65	0.94	1.37	1	0	6	0
Sept.	58.70	73.20	65.95	88	42	46	80	54	29.90	29.88	29.89	30.07	29.68	.39	22	8	17	7	0	4.47	0	4.47	10	9	11	1.47	1.53	0.90	1.30	4	0	3	0
Oct.	47.61	58.35	52.98	73	27	46	70.5	34	29.82	29.82	29.823	30.30	29.29	1.01	17	14	8	10	0	10.15	0	10.15	15	8	8	1.77	1.71	0.94	1.47	5	1	3	1
Nov.	35.70	47.00	41.35	64	22	42	59	29	29.89	29.86	29.87	30.29	29.25	.94	19	11	12	5	0	2.67	0	2.67	15	7	8	1.43	1.37	0.97	1.26	3	1	1	1
Dec.	31.32	38.30	34.81	46	20	26	42.5	25	29.87	29.85	29.86	30.19	29.08	1.11	12	19	9	11	3	7.80	6	8.65	16	11	4	1.87	1.58	1.52	1.66	9	4	0	1
1833	46.31	58.85	52.58	90	4	86	82.5	14.5	29.83	29.82	29.83	30.35	29.08	1.27	214	151	145	97	12	54.92	24½	58.10	129	110	126	1.70	1.70	1.18	1.54	50	24	145	8
1832	45.44	58.35	51.89	88	—6	94	79	1	29.85	29.84	29.845	30.40	29.04	1.36	222	144	146	94	9	50.20	12½	51.75	131	91	144	1.66	1.74	1.24	1.55	39	34	42	7

The observations for the above table were made at Wilmington, Delaware, lat. 39° 40′ E. long. from Washington 1° 50′.

The table, for the most part, will explain itself. The winds are divided into three classes, with reference to their direction and character. In the northerly winds are comprised all between west and north, exclusive of the former and inclusive of the latter; these are generally dry and cool. In the easterly are embraced all between north and south, exclusive of both these points. These are damp and mostly attended with rain. The southerly class contains all from south to west inclusive—these are warm in all seasons, and in winter commonly accompanied with rain.

The "mean force" of the wind is thus found. Observations are made three times daily, and the force of the wind represented by numbers. Thus 0 is calm, or nearly so; 1 is a light breeze, 2 a breeze, 3 a wind, 4 a high wind, and 5 a very high wind. The columns in question are formed by the average of these numbers.

The mean temperature of the year, as the table exhibits, was 52½°, which is about the mean annual temperature of this latitude. The quantity of water which fell in snow and rain was much greater than the average. The three last years have been very wet, averaging nearly 60 inches, or 5 feet of water, each. We may therefore expect the present year, or the next one, to be dry. The average yearly quantity of water which falls in this section of country is about 40 inches or a little more.

The general character of each month in the year, and of the seasons, is here given.

January.—Temperature moderate; no very cold weather. Rains tolerably frequent, and in considerable quantity. No snow of consequence. Much easterly wind and cloudy weather.

February.—Temperature moderate; no severe cold. Rains few and light. Several snows. A number of slight easterly storms.

March.—Temperature low in the beginning, and afterwards warm. The cold was much more severe than during the winter months preceding. Rains very few and slight. Several moderate snows. The ground was dry and the roads dusty at the close of the month. Vegetation started.

April.—Temperature remarkably warm, especially at the end of the month; the thermometer did not once fall to the freezing point. Rains scanty and almost confined to the first week. Vegetation was seriously affected by the drought. Southerly winds prevailed.

May.—Temperature uniformly higher than common. No frost. Rains very frequent and copious. Winds generally southerly and easterly. Frequent easterly storms.

June.—Temperature not remarkable; though perhaps cooler than common; no hot weather. Rains frequent and copious. Several hurricanes in different places. Great freshets in some rivers.

July.—Temperature warm; some hot days. Rains frequent and generally transient and moderate. Much lightning, and several heavy thundergusts.

August.—Temperature cool; no hot weather. Rains seasonable in the first half of the month, but none afterwards. The drought was severe in some parts of the country.

September.—Temperature variable, several days warmer than August and others cooler than since May. A slight frost occurred in some situations on the 14th. Rains seasonable in frequency and quantity.

October.—Temperature moderate at first, but remarkably cold at the end of the month. Rains not very frequent but unusually copious. Snow on the 30th.

November.—Temperature remarkably cold; 14 freezing mornings. Rain few and small in quantity. Three light snows. A most extraordinary meteoric exhibition on the morning of the 13th.

December.—Temperature moderate and very uniform. Rains frequent and abundant. One severe snow storm. Easterly storms frequent and destructive. Winds mostly north and east.

General character of the winter of 1832–1833.—Temperature variable. Navigation of the Delaware unobstructed till the 11th January, when it was impeded for a few days only. On the 2d March the river again filled with ice, and the navigation was checked for a week. Not much snow

till March, when there was enough for a week's sleighing. The winter was mostly rainy and unpleasant.

Spring.—The warm weather which followed the *March winter* brought forward vegetation rapidly. Snow drifts disappeared on the 18th, and the grass began to look green next day. On the 23d, the red maple (ACER *rubrum*) and the candle alder (ALNUS *serrulata*) were in bloom. The farmers were complaining for want of rain at the end of the month. In the first week of April were some refreshing rains, after which came a drought which continued till May, and was then followed by rain, rain, rain. Peaches were in bloom on the 10th April. There were partial frosts on the 26th and 27th. When the rains in May set in, vegetation progressed luxuriantly.

Summer.—Damp, overcast and rainy, with considerable thunder and lightning, until the middle of August, after which there was some delightful weather. The harvest was generally abundant, though the rains interfered with the gathering of it. A large quantity of grain was damaged after being cut. There were numerous destructive freshets in different parts of the country, more particularly in the northern states, and along the Susquehanna. In some districts, however, the opposite condition, that of drought, was experienced, so as to injure materially the crops of Indian corn.

Autumn.—The early part of autumn was fine, pleasant weather. The middle of October was exceedingly rainy. Great freshets occurred in many streams. On the 19th was the first general white frost, with ice in some places. After this, the weather was fair and pleasant, though cool, till December. Some difficulty was experienced by farmers about seed time, on account of the frequent rains.

Winter.—There was no winter sufficient to obstruct navigation in December. The month was rainy and stormy. ÆQLUS.

MISCELLANIES.

1. *The Banana tree* MUSA *paradisiaca.*—Foster and other naturalists have maintained that this tree did not exist in America previous to the arrival of the Spaniards, who imported it from the Canary Islands in the 16th century. In support of this may be adduced the silence of Columbus, Alonzo Negro, Pinzon, Vespucci and Cortes with respect to it. But Humboldt conceives this circumstance only proves the inattention of these travellers to the productions of the soil; and that it is probable the plant presented several varieties indigenous to both continents.

2. *Extent of Cultivation.*—The space favorable to the cultivation of this valuable plant in Mexico is more than 50,000 square leagues, and has nearly a million and a half of inhabitants. In the warm and humid valleys of Vera Cruz, at the foot of the Cordillera of Orizaba, the fruit occasionally exceeds 11.8 inches in circumference, with a length of 7 or 8. A branch sometimes contains from 160 to 180, and weighs 66 to 88lbs. avoirdupois.

3. *Its fertility.*—Humboldt doubts if there be any other plant on the globe which, in so small a space of ground, can produce so great a mass of nutriment. Eight or nine months after the sucker has been inserted in the earth, the banana begins to form clusters and the fruit may be gathered in less than a year. When the stalk is cut there is always found among the numerous shoots which have put forth roots, one that bears three months later. A plantation is perpetuated without any other care than that of cutting the stems on which the fruit has ripened, and giving the earth a slight dressing. A spot of 1076 feet may contain at least from 30 to 40 plants, which in the space of a year, at a very moderate calculation, will yield more than 4000lbs. avoirdupois of nutritive substance. He estimates that the produce of banana is to that of wheat as 133 to 1; and to that of potatoes as 44 to 1.

4. *Weight of a Shark's Liver.*—Leonard, a surgeon of the British Navy, mentions the capture of a shark 10 feet long, while on a voyage to the Western coast of Africa. Its liver weighed at least 100 pounds. In his maw were found half digested lobsters, ribs of beef, and various other articles. It affords a sailor much satisfaction to capture one of these pirates of the deep.

5. LICHEN *roccella.*—In the island of Boa Vista, belonging to the Portuguese government, vast quantities of this valuable lichen are collected. The revenue afforded to the government from this article alone varies from 30 to £40,000 per annum. The natives complain of the exceedingly low price which is allowed them for collecting this valuable lichen. They receive 40 reis (2 pence) per pound. None is allowed to be exported but through the government agent, who receives 6 per cent for collecting, packing and exporting it. A quintal (128 lbs) costs the government about £5, and is sold at Lisbon for £50. So that it is calculated that by the sale of 2000 weight of this article, the government reaps $60,000 clear gain. The plant is collected with much danger and trouble, from the faces of rocks and precipices, over which the natives sling each other for this purpose.

6. *The Harmattan Wind.*—It usually blows strong—directly off the land—about E. or N. E., and seldom continues longer than three or four days. During its continuance there is a dense white haze constantly resting on the horizon. The thermometer falls 3 or 4°—from 82° usually to 78°. It produces on the throat and organs of respiration a suffocating and parching effect, similar to the diluted fumes of burning charcoal, although it feels at the same time cold, as it rushes down the air passages. The eyes feel hot and smarting, owing it is said, to a quantity of impalpable dust floating in the air, borne along from the arid deserts over which it passes. The air at all other times charged with moisture becomes perfectly dry—vegetation is checked, and the young shoots shrivel and decay. People recently arrived seem to suffer less from its effects than those who have resided long in the country. After a shower the smell from the shore is peculiarly potent and disagreeable.

7. *African system of wiving.*—At an annual anniversary of natives of Dahomey, the following system, which assimilates somewhat to the Spartan custom,—is practised among them. All the unmarried females throughout the kingdom are esteemed the property of the sovereign, and are brought to the annual customs, to be placed at his disposal. He selects for himself such as appear most beautiful and engaging, and retails the others at enormous prices to his chiefs and nobles. No choice on this occasion is allowed to the purchaser; in return for his twenty thousand dowries, a wife is handed out, and, even be she old and ugly, he must rest contented; nay, some, it is said, have in mockery been presented with their own mothers. The king usually keeps his wives up to the number of three thousand, who serve him in various capacities,—being partly trained to act as a body-guard, regularly regimented, and equipped with drums, flags, bows and arrows, while a few carry muskets. They all reside in the palace, which consists merely of an immense assemblage of cane and mud tents, enclosed by a high wall.

8. *Curious circumstance.*—The Philadelphia Gazette gives an account of a man 80 years of age, who lately lived at Chowley, (Eng.) About three months previous to his death, his right leg came off at the knee as he lay in bed, without causing him the least pain. He had been a hard working man, but the paragraph does not state whether a new leg came in its place. The only possible mode of accounting for this fact, if it be a fact, is by attributing the separation of the leg to mortification.

6. *Motion of the earth.*—If a carriage wheel, made of the toughest iron, were made to trundle round at any thing nearly equal to the rate at which the earth moves, it would not only be in a moment scattered to atoms, but those atoms would speed away on fire, burning and being burnt with more inten-

sity than any furnace that we could kindle or even imagine as being heated by all the art of the founder, and spread conflagration far and wide. Yet that motion of the earth bends not the slightest thread which the little spider spins from stubble to stubble in the autumnal field; and it is as silent as if the mighty careering mass were in a state of perfect repose.—*Mudie's Obs. of Nature.*

7. *Barking dogs.*—By a very slight puncture on the side of the neck of a dog, a skillful surgeon can divide a nerve which controls the vibrations of the vocal chord, and thus forever prevent the animal from uttering his characteristic voice.

8. *Alphabets.*—The English contains 24 letters, to which if we add J and V, consonants, (formerly used indiscriminately with I and U,) there will be 26. The French contains 23; the Hebrew, Chaldee, Syriac and Samarital, 22 each; the Arabic, 28; the Persian, 31; the Turkish, 33, the Georgian, 36; the Coptic, 32; the Muscovite, 43; the Greek, 24; the Latin, 26; the Sclavonic, 27; the Dutch, 26; the Spanish, 27; the Italian, 20; the Ethiopic and Tartarian, each 202, the Indian and Bengal, 21; the Burmese, 19. The Chinese have, properly speaking, no alphabet, unless we call their whole language by that name. Their letters are words, or rather hieroglyphics, amounting to eight thousand.

9. *Scuppernong.*—Of this grape there are two varieties, the black and the white; both possessing similar qualities. The young wood is very slender, the leaves shining above and beneath. The fruit very juicy and sweet. Wine is made of this grape, of an excellent and very peculiar flavor. Much wine is said to be made of this grape in North Carolina. Many barrels are made in a single season from a single vine. They are trained on arbors over the large court, which usually separates the main houses in that country from the kitchen, which is in the rear; and a single vine will soon cover a space of a hundred feet by forty. The climate of New England is not so well suited to this vine. Accounts have been stated [see New England Farmer] of single vines which would produce forty bushels in Carolina. They are said to flourish and their roots will find nourishment in sandy land, good for nothing else.—*New American Orchardist.*

10. *Double Flowers.*—The petals of all flowers, in a natural state, are single. But, when transplanted into gardens, many of them, especially those which are furnished with numerous stamina, as the anemone, the poppy, the peony, the ranunculus, the daisy, the marigold, the rose &c. double, or rather multiply their flower leaves without end. This change from single to double or monstrous flowers, as they are called, is produced by too great a quantity of nutritious juices, which transforms the stamina into petals; and it not unfrequently happens, that, when these double-flowering plants are committed to a poor soil, they become drier, are reduced to their natural state, and produce single flowers only. Plants which inhabit the valleys, when transported to the tops of mountains, or other elevated situations, not only become dwarfish, but undergo such changes in their general structure and appearance, that they are often thought to belong to a different species, though they are, in reality, only varieties of the same. Similar changes are produced when Alpine or mountain plants are cultivated in the valleys.—*Smellie's Philosophy of Nat. Hist.*

11. *Changes of the Frog.*—When it first escapes from the egg, a frog appears in the form of a tadpole, an animal with a large, roundish head, and a compressed or flat tail, but totally destitute of feet and legs. In this state it remains a considerable time, when the two fore feet begin to shoot, and have an exact resemblance to the buds of trees. As their growth advances, the toes and legs are distinguishable. The same process goes on with the hind legs, only they are somewhat later in making their appearance. During the growth of the legs, the blood being drawn into different channels, the tail suffers a gradual mortification, till at last it totally vanishes and the tadpole is metamorphosed into a quadruped. Tadpoles never come out of the water; but after their transformation into frogs, they become amphibious, and occasionally frequent both land and water.—*Ib.*

12. *Diversity of existence.*—The rat-tailed worm abandons the water upon the approach of its metamorphosis, retires under the earth, where it is changed into a chrysalis, and, after a certain time, bursts from its seemingly inanimate condition and appears in the form of a winged insect. Thus the same animals pass the first and longest period of their existence in the water, another under the earth, and the third and last in the air.—*Ib.*

13. *Transformation of Caterpillars.*—Malpighius informs us that the silk worm, previous to its chrysalis state, casts its skin four times. The first skin is cast on the 10th, 11th, or 12th day, according to the nature of the season; the second in five or six days after; the third in five or six days more; and the fourth and last in six or seven days after the third. This changing of skin is not only common to all caterpillars, but to every insect whatever. Not one of them arrives at perfection without casting its skin at least once or twice. The skin after is cast, preserves so entirely the figure of the caterpillar in its head, teeth, legs, color, hair &c. that it is often mistaken for the animal itself. A day or two before this change happens caterpillars take no food; they lose their former activity, attach themselves to a particular place, and bend their bodies in various directions, till at last they escape from the old skin, and leave it behind them.

18. *Destruction of Deer.*—The Catskill Recorder states that more than *one thousand* deer have been slaughtered within fifty miles of that town during the last month.

19. *Philadelphia Water Works.*—The number of feet of iron pipes for conveying the water through the city and suburbs is 412,234,—equal to 76 miles and a fraction.

AGENTS.

ADAMS, Mass.—*P. Briggs*, P. M.
BRISTOL, Pa.—*Anthony Swain.*
FRANKFORD, Pa.—*John D. Griscom.*
MOUNT HOLLY, N. J.—*Samuel Bullock.*
MORRISVILLE P. O. Pa.—*Hector C. Ivins.*
POTTSVILLE, Pa.—*Charles F. Mann.*
BALTIMORE, Md. { *Joseph Earnest, No.* 40 *S. Eutaw Street.* / *Robert R. Moore*, 200 *Market Street.*
SANDY SPRING, Mont. Co. Md.—*James P. Stabler.*
ALEXANDRIA, D. C.—*Henry Stabler.*
WASHINGTON, D. C.—*Granville S. Farquhar. Penn. Avenue*
LOUISVILLE, KY.—*Wilcox, Dickerman & Co.* Booksellers.
BYBERRY, Pa.—*Isaac Comly, Jr.*
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